

## AMENDMENTS TO THE CLAIMS

### Listing of Claims:

1. (Currently amended) An isolated nucleic acid comprising a nucleotide sequence selected from the group consisting of:
  - a) the nucleotide sequence as depicted in SEQ ID NO: 1,
  - b) a nucleotide sequence which codes for a polypeptide having the amino acid sequence of SEQ ID NO: 2, and
  - c) a nucleotide sequence which codes for a polypeptide having at least 95% homology at the amino acid level with SEQ ID NO: 2, wherein the polypeptide has  $\Delta$ -4-desaturase activity.
2. (Previously presented) The isolated nucleic acid of claim 1, wherein the sequence is derived from a plant.
3. (Previously presented) The isolated nucleic acid of claim 1, wherein the sequence is derived from the class of Euglenophyceae.
4. (Cancelled)
5. (Previously presented) A gene construct comprising the isolated nucleic acid of claim 1, wherein the nucleic acid is functionally connected to one or more regulatory signals.
6. (Previously presented) The gene construct of claim 5, wherein the gene construct comprises additional biosynthesis genes of fatty acid or lipid metabolism selected from the group consisting of acyl-CoA dehydrogenase(s), acyl-ACP [= acyl carrier protein] desaturase(s), acyl-ACP thioesterase(s), fatty acid acyltransferase(s), acyl-CoA:lysophospholipid acyltransferase(s), fatty acid synthase(s), fatty acid hydroxylase(s), acetyl-coenzyme A carboxylase(s), acyl-coenzyme A oxidase(s), fatty acid desaturase(s), fatty acid acetylenases, lipoxygenases, triacylglycerol lipases, allene oxide synthases, hydroperoxide lyases, and fatty acid elongase(s).
7. (Previously presented) The gene construct of claim 5, wherein the gene construct comprises additional biosynthesis genes of fatty acid or lipid metabolism selected from the group consisting of  $\Delta$ -4-desaturase,  $\Delta$ -5-desaturase,  $\Delta$ -6-desaturase,  $\Delta$ -8-desaturase,  $\Delta$ -9-desaturase,  $\Delta$ -12-desaturase,  $\Delta$ -5-elongase,  $\Delta$ -6-elongase, and  $\Delta$ -9-elongase.

8. (Previously presented) A vector comprising the nucleic acid of claim 1.
9. (Currently amended) A transgenic nonhuman organism comprising at least one nucleic acid of claim 1, wherein the nonhuman organism is a microorganism, a yeast, or a plant.
10. (Cancelled)
11. (Previously presented) The transgenic nonhuman organism of claim 9, wherein the organism is a plant.
12. (Currently amended) A process for producing polyunsaturated fatty acids, comprising growing a transgenic organism which comprises the nucleic acid of claim 1, producing polyunsaturated fatty acids in said organism, and recovering the polyunsaturated fatty acids, wherein the organism is a yeast or a plant.
13. (Previously presented) The process of claim 12, wherein docosaehaenoic acid is produced in the process.
14. (Previously presented) The process of claim 12, wherein the polyunsaturated fatty acids are isolated from the organism in the form of an oil, lipid or a free fatty acid.
15. (Cancelled)
16. (Previously presented) The process of claim 12, wherein the organism is a transgenic plant.
- 17-21. (Cancelled)